ABOVE IT ALL: USGS RESEARCHERS KAREN HOLZER AND TARA REARDON USE A SURVEY GRID TO COUNT PLANT SPECIES IN GLACIER NATIONAL PARK.

PHOTO BY BLASE REARDON / USGS

Chasing Climate Change

Alpine scientists scale peaks to track global warming. *By Anne Sasso*

A DELICATE SPINE of brown rock falls away from the Continental Divide and then rises as an unnamed peak looming 1,400 feet above Pitamakan Lake. From a distance, this unassuming pyramid in the southeast corner of Glacier National Park appears as barren as the moon. But climb it on a spring day and you'll find a riot of wildflowers—like purple sky pilots and goldfingers—poking up between the rocks.

This year, the flowers will bloom again, but whether your grandkids will see them is up for debate. These ecosystems are highly acclimatized to their chilly setting, and steadily rising temperatures could uproot this hidden garden.

In Europe, scientists saw the threat of alpine climate change a decade ago. A century of

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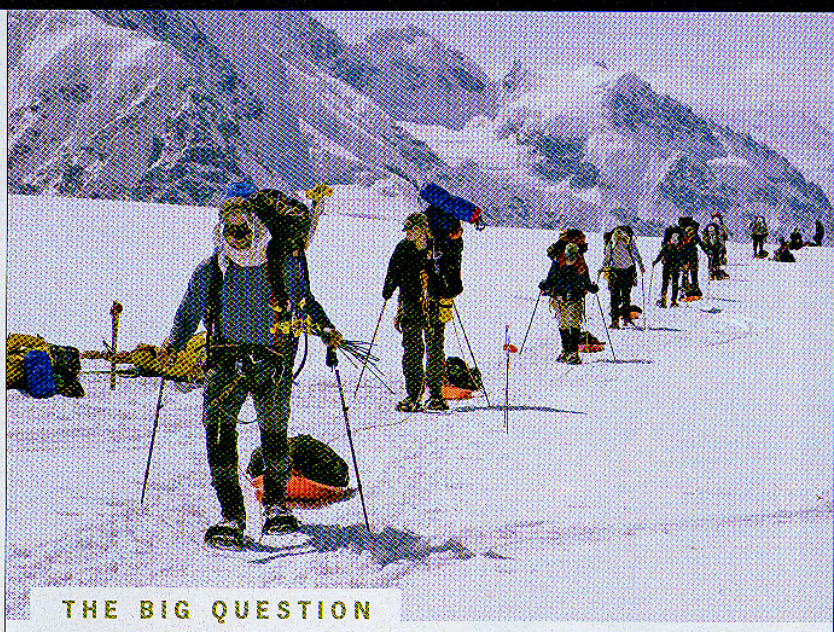
warming in the Alps, they concluded, had pushed plants to higher elevations at the rate of a foot a year. Ecologists reacted by launching the Global Observation Research Initiative in Alpine Environments (GLORIA), the first effort to gauge the long-term impact of climate change on high peaks. Today, researchers monitor vegetation and temperature on 66 ranges around the world.

In North America, that effort is co-chaired by Dan Fagre, a USGS ecologist stationed in Glacier. Combining peak-bagging and research appeals to Fagre, an avid mountaineer who has summited Mt. Shasta and several Mexican volcanoes. Climbing has showed him both the toughness and fragility of alpine zones. "Mountaintops, like polar regions, have already seen three times the average global climate change," Fagre says. That's because their increased exposure to atmospheric conditions makes them more susceptible to fluctuations in temperature and solar radiation.

The remote summit above Pitamakan Lake is ideal for climate-change research, but difficult to access. The approach crosses forbidding terrain; during one trek, a grizzly wandered through Fagre's basecamp searching for lily bulbs. "It looked like the place had been roto-tilled," he recalls. Aside from multiday backpacking gear, his team hauls supplies for a detailed plant survey, including measuring tape and wooden grids. Before descending, they bury temperature gauges to be checked once a year.

With their global data set, GLORIA scientists are creating a much-needed baseline for mountain ecosystems. Already the research is producing results: A 2006 study concluded that rising temps contributed to declining plant levels in the Austrian Alps. Meanwhile, scientists are expanding the project by adding new peaks in Yellowstone and the Wind River Range. According to Fagre, surveying more mountains is not only exciting, but essential. "Tiny differences at one summit don't matter a hoot," he says. "But very small changes on dozens of mountains will tell us much more."



THE BIG QUESTION

Should Denali cap climbing permits?

Being tallest has its disadvantages. For Mt. Everest, it means traffic jams at 28,000 feet. Closer to home, the National Park Service is concerned that Mt. McKinley, North America's highest peak, is getting too popular. Last fall, the NPS proposed a limit of 1,500 climbing permits per season starting in 2008. Its reason: The fixed lines on the peak's popular West Buttress Route cannot safely accommodate an expected surge in early-summer climbers. Currently, the NPS is deciding if the restrictions should apply to the West Buttress only, or to the entire mountain.

YES A combination of fierce weather and limited air service to the basecamp encourages 90 percent of McKinley climbers to attempt the West Buttress Route between late May and early June. One bad storm in that small window of time could easily delay 300 climbers at 14,200 feet (1,000 feet below the fixed lines). When the weather clears, the rush of climbers ascending the fixed lines could result in a major disaster if the ice anchors fail. Only 1,151 climbers attempted to summit the mountain last year, so the proposed limit of 1,500 permits is merely a preemptive action to ensure safety in the future. Parks such as Rainier, Grand Canyon, and Yosemite use permits to limit backcountry and climbing access, and Denali needs to, as well.

Daryl Miller
South District Ranger
Denali National Park

NO Mt. McKinley is too remote to be dangerously crowded. In my quarter-century of climbing and guiding on the mountain, I've observed crowding only during the high season, when climbers congregate on the West Buttress fixed lines. An annual permit cap won't solve that problem, though it could prevent experienced climbers from attempting the mountain when the slopes are clear. Instead of new limits, the Park Service should take steps to encourage both guided groups and experienced climbers to utilize the full season, from the beginning of May through the first week of July. And if the NPS does approve permit restrictions, it should target only the high-season climbers who attempt the West Buttress Route.

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